

#### ABSTRACT OF THE DISCLOSURE

A method forms a vapor-deposit layer of needle-shaped x-ray luminophore containing at least one alkali metal doped with europium on a carrier. The method includes placing a mixture of  $\text{Eu}_3\text{O}_4\text{Hal}$  and at least one alkali halogenide in a molybdenum vaporizer, heating the mixture to simultaneously vaporize the mixture and to deposit it on a carrier, wherein Hal is at least one halogenide from a group consisting of F, Cl, Br and I. The ratio of the Eu concentration of the alkali halogenide layer in the proximity of the substrate to the Eu concentration of the alkali halogenide layer in the proximity of the surface can preferably be reproduced with a factor of 0.4 to 1.2, and preferably between 0.6 and 0.8.